Princess máxima center
pediatric oncology

Digital and Technology Strategy 2025-2028

ICT, Data, and Healthcare Technology
at the Princess Máxima Center

Table of Contents

Would you like to read a short version? You can find it here.

For the best reading experience, we recommend saving the file to your desktop and opening it from there. This ensures that all links function optimally.

1 Introduction

‘Moving Forward Together,’ the multi-year strategy of the Princess Máxima Center for the 2024-2028 period, describes our center as an organization that revolves around integration, also internationally. Our mission—to cure every child with cancer with optimal quality of life—can only be realized through the integration of care, research, and education.

This broad perspective and the necessary multidisciplinary approach make high-quality ICT, data, and healthcare technology indispensable. How we will further develop these aspects in the coming years is outlined in the Digital and Technology Strategy 2025-2028.

This sub-strategy within ‘Moving Forward Together’ describes how digitalization and technology can contribute to the three main strategic themes of the Princess Máxima Center: innovation, organization, and collaboration.

In line with our commitment to innovation for children with cancer, the Digital and Technology Strategy emphasizes advancements in ICT, data, and healthcare technology—while ensuring continuity in daily operations.

Within our center, the importance of digitalization and automation is widely recognized. Therefore, data provision is one of the nine strategic topics in the overall Máxima strategy. The Digital and Technology Strategy elaborates on this topic but takes a broader perspective; it describes the use of ICT, data, and healthcare technology to achieve our mission.

To ensure innovations work in practice—and to enhance Máxima's execution power—clear processes and structures are necessary. At the same time, it is crucial to properly guide ideas that employees of our center develop within their professions so they align optimally with strategic themes.

The Digital and Technology Strategy acknowledges the full spectrum of ideas and initiatives that contribute to our mission. At the same time, we remain mindful of maintaining and optimizing existing systems and processes.

2 Why a Digital and Technology Strategy?

At the Princess Máxima Center, digitalization, automation, and other technological applications are not exclusive to the ICT & Data Technology (IDT) department—they impact everything we do, inside and outside our walls. Implementing and using technology is not the responsibility of a single department: IDT is a collective effort. This makes it essential to collaboratively develop and implement the Digital and Technology Strategy.

The world of ICT, data, and healthcare technology is evolving rapidly. Consider the impressive possibilities of artificial intelligence (AI) and developments in digital communication, or the opportunities in new medical applications.

To stay up-to-date—and even ahead—we need a clear strategy. Our Digital and Technology Strategy keeps us focused on where we want to go as a center. It serves as our compass for making smart choices: where do we allocate our energy and resources—and what do we set aside (for now)? In today's era, a solid Digital and Technology Strategy is a crucial key to innovation and growth.

As a pediatric oncology center, we have significant ambitions in technology, but we cannot do everything at once. This strategy helps us maintain focus. With every step we take, we ask some important questions:

- **What is the added value?**
- **How does it contribute to our mission?**
- **What are the costs in terms of time, resources, and personnel?**
- **What value does an investment provide, measured in time, resources, personnel, quality, and satisfaction?**

The Digital and Technology Strategy is not a recipe book but a roadmap. This document does not prescribe what must be done but provides direction. It offers a framework for collectively determining how technology strengthens our mission. It focuses on the journey, not just the destination. The process is as important as the document you are currently reading. The intensive process leading to the Digital and Technology Strategy marks the beginning of an ongoing dialogue.

Together, we will continue to discover, learn, and adjust. This keeps us agile in responding to new, as-yet-unknown developments, ensuring that our priorities align with our **available people and resources** to achieve the right outcomes. Technology is not just a tool; it is a force that brings us closer to our mission. This strategy helps us realize our ambitions while maintaining focus. We build the future together—with vision, smart choices, and targeted steps forward.

Role of Other Departments

The use of ICT, data, and healthcare technology is often directly associated with the IDT department. However, multiple departments at the Máxima Center actively contribute to this area. The Academy provides training to support data and technology use and raises awareness of issues like security risks. It also offers specialized training for specific applications. The Trial and Data Center (TDC) and the Big Data Core (BDC) support research by collecting and utilizing data for studies and research, playing a role in developing AI models. Many departments within our center manage applications functionally. This Digital and Technology Strategy applies to them as well.

Interview

Michiel Kooper, Director of IDT

A Meaningful Conversation About the Best Technology

‘Digitalization and technology often seem abstract. And when discussed at a strategic level, they can feel even more abstract. But in reality, they are about very concrete things that affect everyone at the Máxima Center. Our Digital and Technology Strategy helps to make this tangible.

Take, for example, the chapter on innovation in Moving Forward Together, the Máxima’s multi-year strategy. When it relates to CAR-T or immunotherapy, the focus is mainly on the clinical aspects. But underlying these innovations is a significant IDT component. Consider the vast amounts of data involved. Properly organizing this is not something that a few tech experts can accomplish on their own. It only works when those who work with the data, engage in conversations with those who design the data systems. Our Digital and Technology Strategy is meant to support that dialogue so that, together—through mutual understanding—we can develop the best systems and applications.

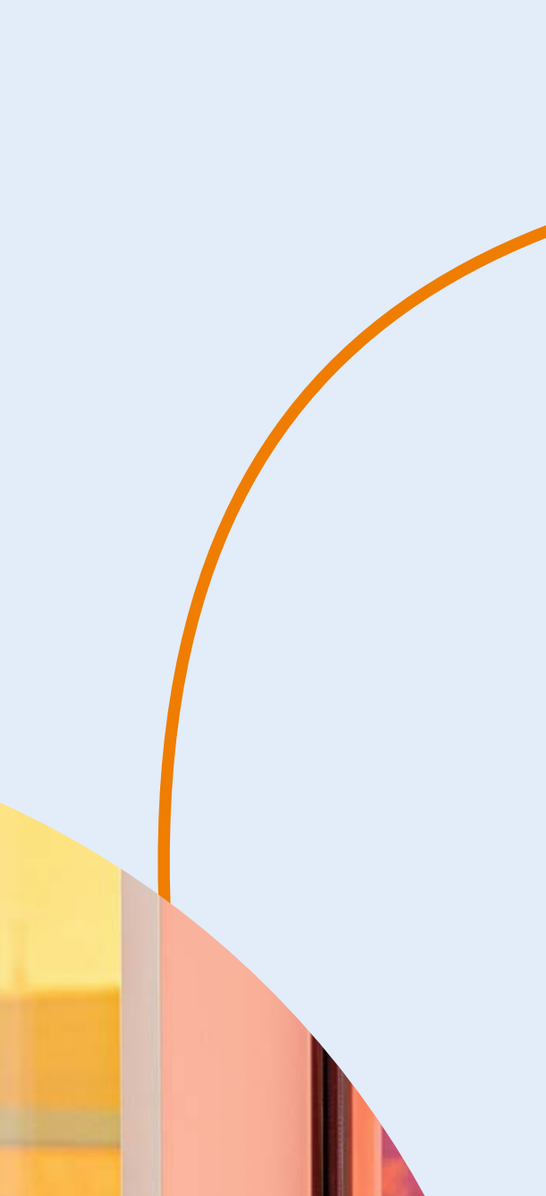
‘Our Digital and Technology Strategy helps to make the abstract tangible. It’s about things that affect everyone in our organization.’

What I really appreciate is that we wrote this strategy together with many colleagues. This internal dialogue started during the writing process, involving people from research, nurses, doctors, and staff. Good ICT, data, and healthcare technology are essential for everyone in our organization to do their work effectively. Whether it’s computing power for complex analyses, the use of silent alarms, or digital tools that save time and enhance communication with children and parents—this strategy helps us have more focused discussions on what is needed on the work floor and what priorities we should set as an organization.

At the same time, we must remember that digitalization and technological innovations are not the solution to everything. The real value lies not in the technology itself but in how we use it. And it’s not as if ‘we at IDT’ have a toolbox with ready-made solutions for everything. That’s why the second chapter of the strategy states: IDT is something we do together! Again, it comes back to that internal dialogue.

At the Máxima Center, we aim for the newest and the best—that ambition aligns with our mission. In that sense, it’s actually a good thing that we always want more than what seems possible. But it also challenges us to make sharp, well-thought-out choices together. We don’t have to do everything ourselves. We can also make use of the opportunities that already exist—within the Máxima Center, at UMC Utrecht, or at the Utrecht Science Park. Together, we need to figure out how to make the smartest possible choices about what can be achieved.

My call to colleagues is: join the network of professionals in care, research, and staff who contributed to this strategy. That way, you can help ensure that the best possible ICT, data, and healthcare technology are used at the Máxima Center.’



3 The Connection Between the Digital and Technology Strategy and ‘Moving Forward Together’

The Digital and Technology Strategy 2025-2028 is closely aligned with ‘Moving Forward Together.’ Technology impacts all aspects of our work. Therefore, we have consolidated the technology needs arising from the Máxima strategy into a set of key topics in ICT, data, and healthcare technology. These were identified after discussions with experts from research, care, staff, and IDT about the facilities required to implement the Máxima strategy. Some examples of how the two strategies align (the numbers correspond to the strategic topics in ‘Moving Forward Together’):

1.1 Immuno- and Cellular Therapy:

These treatments are supported by high-quality imaging and storage, which requires robust computing and storage facilities.

Digital Ecosystem >

1.2 Innovative Diagnostics and Therapy:

This strategic topic emphasizes (inter)national collaboration and data exchange.

Digital Ecosystem > Internationalization >

Modernization of Data Strategy >

1.3 Quality of Life:

Increased focus on patients requires new tools and improved information provision.

The Digital Patient >

2.1 Execution Power:

Shared research and care facilities enhance synergy between these two areas.

Digital Ecosystem > Relieving Care Professionals >

Professional Use of ICT, Data, and Healthcare Technology >

2.2 Employer and Employee Engagement:

Digitalization makes work easier and more enjoyable. We support employees in adapting to these changes in their daily work and help them develop digital skills.

Relieving Care Professionals >

Modernization of Data Strategy >

Professional Use of ICT, Data, and Healthcare Technology) >

2.3 Data Provision:

This topic has been integrated and further developed within the overall digital and technology strategy.

Modernization of Data Strategy >

3.1, 3.2, 3.3 Collaboration (local, national, international):

Topics from ‘Moving Forward Together’ have been incorporated and expanded within the digital strategy.

Internationalization > Relieving Care Professionals >

The Digital Patient >

The choices we make at the Máxima Center regarding innovations in ICT, data, and healthcare technology, and how we plan to approach them in the coming years, are detailed in the next chapter.

A preliminary remark: In developing this Digital and Technology Strategy, we have been keenly aware that in addition to innovation, we must also continuously maintain and optimize our existing systems. Ensuring continuity and improving our foundation in ICT, data, and healthcare technology will remain a key focus for the organization.

4 Digital and Technology Strategy in Six Areas

4.1 Supporting Care Professionals

Significant investments have been made in new technologies and systems to support care professionals. However, there is still room for improvement. For example, a better-optimized EPR (electronic patient record) can streamline care processes, reduce administrative burdens, and allow care providers to access patient information more easily, leading to better and faster decision-making.

Another key area is the medication process: This can be made more efficient while ensuring patient safety. The mandatory double-check by two nurses is time-consuming, and alarm systems—from infusion pumps to monitoring devices—can be optimized to reduce unnecessary noise and stress for both children, parents, and staff.

Finally, we see opportunities to improve planning and scheduling. Optimizing staff deployment increases productivity, reduces over- and under-staffing, and better meets the needs of departments, employees, and patients.

Our Ambition

We aim to create an environment where care professionals are optimally supported by smart systems and technology. This enables them to work more efficiently, enjoy their work more, and continue to deliver high-quality care.

Goals

Less Clicking, Less Typing
We significantly reduce administrative burdens in the electronic patient record (EPR). By improving system configurations and using modern technology, we work smarter and more efficiently, fully aligned with the care professionals' workflow. AI applications such as speech-to-text and automated medical letter generation are part of this effort.

Quick and Easy Access to Up-to-Date Care Information
Care professionals always have access to the latest patient information. Decision-support tools and easier and direct access to HiX allow for faster and more accurate decision-making. Vital signs measurements (e.g., blood pressure, temperature, heart rate, respiration, oxygen saturation) are automatically integrated into HiX, reducing transcription errors and administrative workload.

Safer and More Efficient Medication Management
We work toward reducing administrative burdens and double-checks in medication processes without compromising patient safety. An intuitive cytostatics system will help prevent medication errors, Also, we aim to establish a closed-loop medication process.

The Right Alarm Notification to the Right Person
Alarms will be silenced where possible, ensuring that only the right alarms reach the right person at the right time. Care workers receive only relevant notifications, increasing their focus and reducing unnecessary stress. This contributes to a calm work and care environment.

Smarter and Integrated Planning
We reduce workload by implementing more efficient, integrated, and predictive planning and scheduling, supported by technology. This ensures that staffing levels align optimally with the needs in the departments and those of our patients.

How Will We Achieve This?

We will enhance existing healthcare technologies and software, making better system integrations and leveraging innovative technologies. Administrative burdens will be reduced through the optimization of HiX and AI applications such as speech-to-text.

We will explore AI technology for clinical decision support and preventive alerts. All care professional will have access to patient information via mobile devices. The medication process will be streamlined by implementing digital double-checks where possible.

For infusion technology, we aim for seamless integration. Essential alarms will remain audible, while less critical ones—where clinically justified—will be silent and directed to the appropriate care professional's personal device. We will also investigate predictive algorithms for smarter and more efficient planning.

Interview

Renske Karens, Chief Nursing Information Officer (CNIO)

Innovative Solutions for Smarter Bedside Work

“When I speak with colleagues on the departments, I hear many ideas and wishes for practical applications in daily work. Digital communication tools, for instance, to translate information more effectively. Smart infusion pumps that perform double-checks or targeted patient calls via a tablet. A mobile device with access to the EPR, allowing you to move freely throughout the hospital while staying connected. These have been top priorities for nurses at the Máxima Center for years.

For monitoring and alerting, much has already been improved by now. But if you accompany a doctor’s visit, you still have to write down the important points from the EPR on a piece of paper beforehand.

‘We all worked on the Digital and Technology Strategy together. Now let’s make it a reality together!’

Speech-to-text could significantly benefit nurses. Imagine having an EPR device at hand during a conversation. You’d be able to record it and

automatically fill in the patient's anamnesis. After reviewing this text, you could directly add it to the EPR.

We can also greatly improve the way patient data is recorded, reducing administrative workload and freeing up more time for patient and parent interaction. This is especially important as we increasingly host complex international patients in our center.

Another key area is creating a quieter work environment. Children often have multiple pumps—sometimes even ten—resulting in a constant stream of alarms. Add to that some other patient alarms, and the cacophony is complete. Combining multiple alarms on a single smartphone has already improved the situation, but further fine-tuning is needed to ensure care professionals only receive the most relevant signals. Another idea is that a child, for example via a tablet by the bed, can directly ask the kitchen for that tasty smoothie. Or a facility worker for an extra towel. Now those requests all come to the nurse as well, because there is only one button to push if you as a child or parent need something.

Additionally, we need better digital communication tools, such as translation aids to support families from diverse cultural backgrounds. Or if people have difficulty understanding information because Dutch is not their mother tongue or because they have reading difficulties. It's exciting that all these elements are included in this strategy.

This strategy is a collective effort, and now we must realize it together! My message to colleagues is: share your ideas for smarter and better work processes. Reach out to the innovation hub—an internal network of colleagues who can provide advice and support. Your expertise can drive innovative ICT, data, and healthcare technology solutions that truly enhance daily work.'

4.2 Modernization of our Data Strategy

A key pillar of Máxima's strategy is establishing a state-of-the-art data provisioning (including governance and training) that enables seamless collaboration across the organization. This infrastructure will maximize the use of both (pre)clinical research and healthcare data.

In section 2.3 of 'Moving Forward Together,' the Máxima Center outlines the importance of making all relevant internal and external data sources accessible. IDT, TDC, BDC, and the Academy have already been working on this through the Data Program and the **Institutional Data Board (IDB).** We will continue this program.

A major challenge is increasing employees' knowledge and skills. The Academy supports the organization in their data literacy. The Máxima Center must evolve into a data-driven and data-savvy organization—data is only a powerful tool when used effectively.

Our Ambition

Data provisioning is a fundamental element of care and research. It enables more precise diagnoses, scientific analysis, outcome measurements, and treatment decisions. We aim to become a data-driven organization with high data utilization maturity in daily practice.

Goals

Data Accessibility & Standards

We realiseren de doelstellingen uit paragraaf 2.3 van ‘Samen verder gaan’, zowel voor zorg als research. Daarbij stellen we ons steeds de vraag welk beleid en welke projecten daar dan bij horen. Data-items zijn toegankelijk en inzichtelijk, en waar mogelijk gebaseerd op (inter)nationale standaarden. Zowel in zorg als research worden zoveel mogelijk interne en externe bronnen gebruikt. Door preklinische en klinische data te combineren met patiëntdata, kunnen we immers nog meer het verschil maken. Datasets kunnen (inter-) nationaal worden gedeeld waarbij informatieveiligheid centraal blijft staan. We voldoen hiermee aan de eisen uit en het Integraal Zorgakkoord (IZA), de European Health Data Space (EHDS) en de EU Artificial Intelligence Act.

Data Governance Structure

We develop a clear data governance structure with strategic, tactical, and operational layers. The strategic level is firmly embedded within our IDT governance (see section 5.3), with clear mandates to review and steer project proposals against the strategy. For each level, we are working on specifying the organizational entities and individual roles with associated responsibilities.

Data-Driven Culture

Among care, research and staff is a culture with a high degree of data awareness. Employees understand data standards, can apply these wherever possible, and maintain high data quality. Within the organization, opportunities to make data-driven decisions are seized and shared transparently. Employees know how to formulate their data questions sharply, making proactive use of the data provisioning.

How Will We Achieve This?

Crucial to the success of these goals is the continuation of the existing Data Program under the name ‘Data Program 2.0’. This program provides a framework for launching the necessary projects in the coming years, prioritizing ‘must-haves’ over ‘should-haves’. From our IDT governance, we will further develop the data governance structure: a well-functioning model with roles and entities at strategic, tactical, and operational levels.

In terms of data provisioning, we already have some intuitive search systems that allow employees to find available data. These systems will be further expanded and continuously modernized. We aim to minimize reliance on underlying systems, such as the EPR, for ‘secondary use’ of data. Therefore, in collaboration with UMC Utrecht, we are developing a data platform to make data (near) real-time more accessible.

To promote a data-driven culture, we will focus on learning and development in line with our **strategic training plan.** We will also establish internal data roles (such as data stewards) within research, care, and business operations.

From the Data Program 2.0, we will work on embedding data usage in daily practice. Together with the Academy, which has included this in their strategic training plan, we will train and develop employees in data literacy and digital skills.

4.3 Digital Ecosystem

The pace of digitalization is accelerating. We work with vast amounts of data—big data—and, due to our extensive research department, we handle significantly more data than most hospitals.

This raises important questions. How do we store data efficiently? Are we compliant with laws, regulations, and other relevant guidelines? How do we ensure the computing power we need? And how do we intelligently utilize artificial intelligence (AI) in both research and care? In addition to data provisioning (Section 2.3 in ‘Moving Forward Together’), the Máxima strategy outlines an internationally accessible data platform as a goal in Section 3.3. According to our strategic training plan, we can share knowledge more efficiently using so-called ‘large language models’. Currently, we work with a wide variety of platforms, systems, and suppliers. It is like building a house without a clear blueprint. When it comes to storage, cloud solutions, and computing, we have many options to choose from, each with its own limitations.

We face challenges related to scalability, efficiency, usability, and future-proofing—challenges we will address together. A digital ecosystem is like the infrastructure of a smart city. An effective network of roads, public transport, parking spaces, and traffic management forms a solid foundation to ensure efficiency and accelerate developments.

Our Ambition

We aim to establish an optimal digital ecosystem: a dynamic, integrated environment consisting of big data and computing power that enables us to efficiently and effectively implement technological innovations and developments, such as AI.

Goals

Computing (Processing Power)

The Máxima Center requires significant computing power for various tasks, such as processing DNA information, conducting statistical analyses, and handling radiological scans. With a range of hybrid solutions—combinations of cloud computing and local workstations—we ensure optimal facilitation for all needs.

AI

To facilitate all AI innovations and developments, the IDT department will provide AI support and consolidate relevant expertise. This will leverage the knowledge and experience of our in-house and external AI and data experts. This initiative will centralize oversight on key aspects of AI development, including knowledge sharing, regulatory compliance (such as an algorithm registry). We support, deploy expertise and pool knowledge together with the Academy, whose role is to contribute to internal communication and training aimed at ‘AI literacy’ of employees.

Big Data Storage

We will implement a hybrid solution for big data storage (partly local, partly cloud-based). This approach enhances data management and is suited for (inter)national collaborations, automated data handling, and integration of various storage systems—flexible where needed, standardized where possible. This applies especially to data-intensive systems, such as those used for sequencing and imaging.

Cloud Storage

It is inefficient, both in cost and management, to store ‘cold data’ (rarely accessed data) on local servers. We will ensure all cold data, whether for research or care, is archived using cost-effective solutions. Cloud storage is often more efficient and environmentally friendly, but final decisions will be based on an analysis of the most effective and cost-efficient option.

Architecture

We will establish a clear vision and well-defined frameworks to guide the design and development of our network, infrastructure, computing platforms, and application landscape. A strong architectural framework ensures current solutions remain compatible and that new implementations meet predefined criteria.

How Will We Achieve This?

Three departments at the Máxima Center are involved in data processing: TDC, BDC, and IDT. These teams will play a key role in implementing the digital ecosystem. We will begin by assessing our network, computing power, infrastructure, and application landscape. Additionally, we will develop a test framework for selecting IT suppliers, open-source solutions, and internal application development. We will evaluate our current IT suppliers and determine which roles and expertise the Máxima Center needs to develop in-house for an effective architecture.

Ahead of a Máxima-wide approach, we will first establish hybrid big data storage solutions for research, facilitating (inter)national collaboration. This could also support projects such as setting up a database for intraoperative MRI images.

We will further professionalize cold data storage for research, followed by solutions for our care department. To enhance computing power, we will identify priority tasks and explore new technologies such as edge computing and next-gen platforms.

We will leverage AI knowledge within IDT and other departments, including bioinformatics and the AI knowledge group, as well as external expertise. We will involve all disciplines and develop new services to support the organization, ensuring alignment across the various themes in this Digital and Technology Strategy.

4.4 Internationalization

Strategic topic 3.3 in ‘Moving Forward Together’ states that the Máxima Center aims to strengthen its international position as a leading center for pediatric cancer research, care, and education. Internationalization is not an end goal but serves as a catalyst for achieving our ICT, data, and healthcare technology ambitions—both internally and in collaboration with shared care hospitals and regional partners.

The focus in 3.3 is on developing innovative therapies and knowledge-sharing, particularly in clinical trials involving international patients, both at the Máxima Center and partner hospitals. We collaborate internationally to improve care and expertise worldwide. However, international care professionals currently face challenges in digitally submitting patients for second opinions, Máxima International Tumor Boards, and consultations. Not all guidelines and protocols are available or validated in English, and (international) professionals have limited access to digital training opportunities. Research is hindered by fragmented data storage and limited standards for data sharing and collaboration.

Additionally, relationship management can be improved. There is no centralized system for (inter)national contacts, including contract status tracking. The overview of (inter)national collaborations and reporting is fragmented.

Our Ambition

International collaborations and contacts in research, care, and education are optimally supported by validated applications for information provision, communication, training, and data management. This will also benefit national and regional collaborations. Internationalization is therefore integral to our work in ICT, data, and healthcare technology in the Netherlands.

Goals

Patient Care

We will establish a fully integrated digital environment for care professionals treating international patients, facilitating seamless data exchange. Every international patient will receive clear, direct information in their own language, supported by innovative digital technology.

Professionals

A platform will provide guidelines and training materials validated in English. Care professionals will have online access to accredited courses, both domestically and internationally, and digital communication tools for multilingual support.

Data and Research

We continue to build a data platform for (inter)national collaborations that complies with the European General Data Protection Regulation (GDPR) and the FAIR principles (Findable, Accessible, Interoperable, and Reusable). Our (inter)national collaboration is supported by capabilities for joint data registration, data exchange, and analysis.

Relationship Management

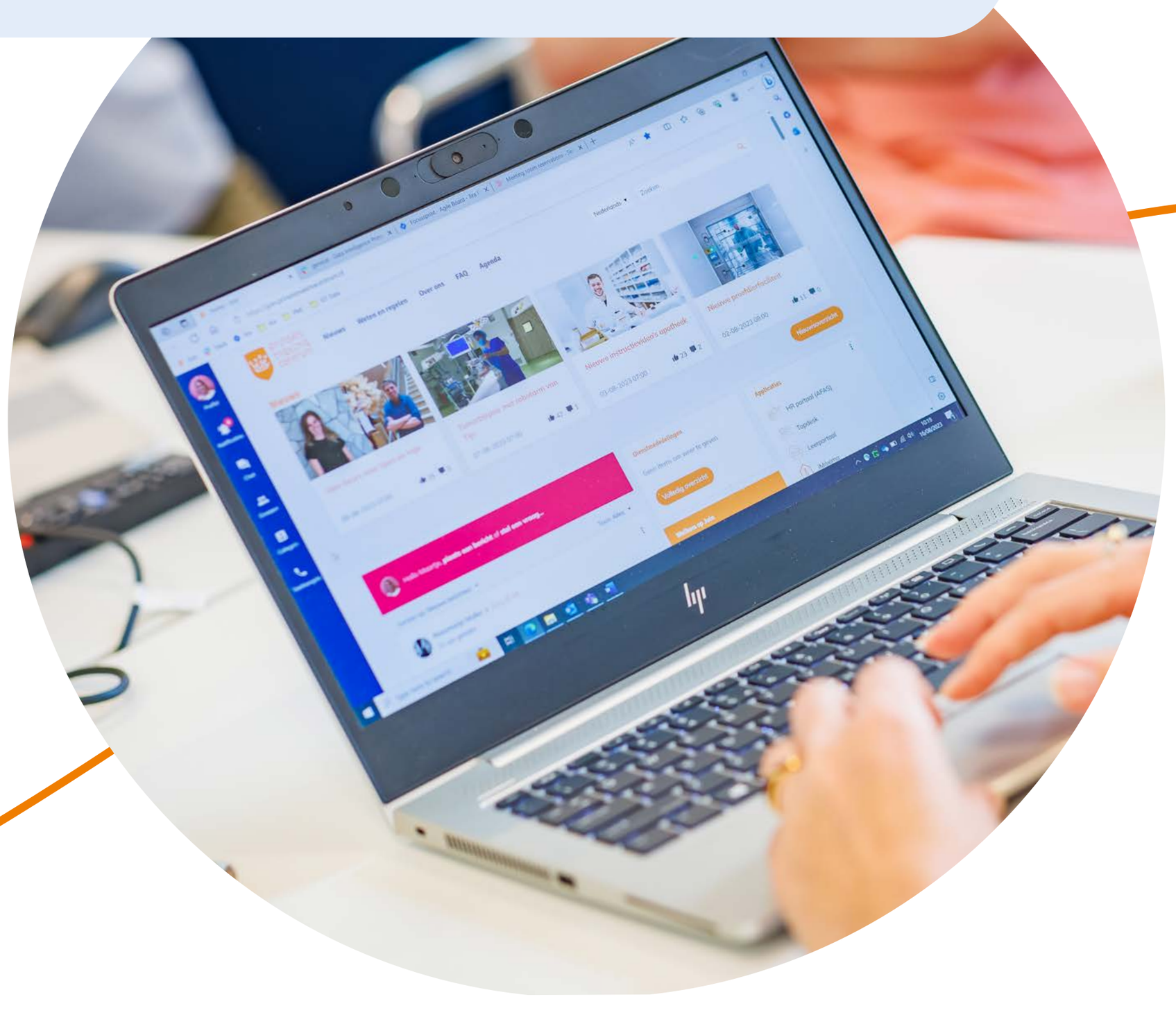
We work with a scalable customer relationship management (CRM) system that provides insights into partnerships and ongoing projects, both domestically and internationally.

How Will We Achieve This?

For international patient care, we will establish a fully integrated digital access system for relevant patient data, including options for remote consultations and second opinions. This will be aligned with what is available for patient care in the Netherlands. We will implement a digital tool for real-time translation of information. Care professionals will find all our protocols and guidelines validated in English on a digital platform. They will also have access to Máxima apps and applications, including training materials.

For data and research, we will adhere to European standards for data exchange wherever possible. We are developing a data platform for (inter)national collaborations that complies with GDPR and adheres to FAIR principles. Our goal is to provide services for (inter)national data exchange, with a joint data registration and analysis platform as the ultimate objective.

For relationship management, we will begin implementing a scalable CRM system with clear descriptions of primary processes. We will standardize reporting on (inter)national contacts using automated workflows.



Interview

Friederike Meyer-Wentrup, Chief Medical Information Officer (CMIO)

Technology Helps Us Work Even Better Toward Our Mission

“Digitalization is one of those topics people often grumble about at the coffee machine. This doesn’t work, that isn’t functioning properly—I hear these comments now and then. But when I ask further, sometimes technology is blamed for poorly designed processes. My response is: If something isn’t working at the process level, we need to fix that first. Then we can use ICT, data, and healthcare technology to improve it even further. As CMIO, I am, of course, also interested in technology itself—I love new gadgets. But what really matters is what’s underneath that technology: the way we want to work.

The backbone of our Digital and Technology Strategy is the mission of the Máxima Center and how technology can help us achieve it more easily and with even greater quality. As a pediatric oncologist, I see many opportunities.

For example, if we can better record patient data and make clinical documentation clearer and easier, then everyone who needs access can find relevant information quickly. As a doctor, you want to focus on interacting with the child and their parents, not on administrative tasks. This is possible when you know that your work is supported by reliable and stable ICT systems.

I appreciate that this strategy explicitly invites staff to contribute improvement suggestions. The best ideas often come from care professionals. For example, we developed our cytostatics software in-house. Thanks to input from colleagues, we are now on version 3.0. The idea of silent alarms—an initiative we will be working on in the near future—also came from our own nurses.

‘The Digital and Technology Strategy invites us to make the best choices together. Everyone can be part of the solution.’

Or take **Mijn Máxima Paspoort** (‘pediatric oncology passport’) as part of the EPR. This great tool for interdisciplinary collaboration was conceived by one of our colleagues and co-created with our software provider. AI applications still make many professionals nervous—they don’t want to make mistakes, so an AI tool for decision making support must be absolutely reliable. But take something as simple as taking notes of a meeting. With speech-to-text, we can create accurate transcripts and even summaries. This makes our work clearer and more transparent, increasing the execution power of the Máxima Center.

This Digital and Technology Strategy will help us make the best choices together. It affects the work of everyone at the Máxima Center, and we all need to decide on priorities. I hope colleagues see it as an invitation to keep contributing great ideas that align with our shared mission. You, too, can become one of Máxima’s experts in ICT, data, and healthcare technology—and be part of the solution.’

4.5 The Digital Patient

‘Moving Forward Together’ states that the Máxima Center aims to give children, survivors, and parents more control and actively involve them during and after treatment through digital applications. This contributes to a better quality of life and an improved patient experience. We already use various tools to support autonomy, but there is no clear structure (architecture) to determine which digital resources we should or should not offer.

Supporting autonomy also means providing clear and accessible information—both general and specific about the illness and to the patient. This helps children and parents understand their situation and what will happen at our center (preparation and education). Care professionals use digital tools to monitor patient health effectively.

HiX is the central information system where professionals add information and patients. Patients can view their medical record in HiX via a patient portal. There is also a need for a platform where parents and children can share information (e.g., completed questionnaires) so that care professionals can access and use it to improve care.

Additionally, digitalization is essential for communication with families from diverse cultural backgrounds, including international patients. Current translation solutions are not optimal, and better tools are needed to ensure privacy and information security.

Our Ambition

We optimally support children and families with digital applications that promote autonomy and provide reliable, accessible, and tailored information. This improves communication with both Dutch and international patients.

Goals

Tailored Information

We provide children, parents, and survivors with the right information, allowing them to control when and how they receive it. Personal interaction remains essential. Digital information is a supplement, not a replacement. The Máxima Center has a responsibility to ensure people understand the information that is provided.

Infrastructure for Apps and Applications

We have a clear vision for deploying digital tools for children, parents, and survivors. We establish guidelines on how these apps and applications fit within Máxima's infrastructure. Tools that do not fit within this framework will be labeled 'Approved by the Máxima Center,' ensuring people can trust them.

Communication Tailored to Language and Level

We provide information in a way that is accessible to children and parents. Translated content meets high-quality standards, considering privacy, security, and regulatory compliance. We also support families who struggle with digital tools or do not speak Dutch as their first language.

How Will We Achieve This?

To provide tailored information to children, parents, and survivors, we will continue developing digital tools. Within HiX, we will improve readable medication overviews and mobile access to the patient portal. We will evaluate whether KLIK can be used to allow patients and parents to securely input data into our databases. We facilitate care professionals to access this data in an easy way. Additionally, we will develop M4You further, including specific environments for siblings, survivors, and parents. To integrate digital tools into Máxima's infrastructure, we will establish clear guidelines for new applications.

We will co-create app development and project prioritization with (representatives of) children and parents. We will create a single digital access point for families at the Máxima Center and explore a patient helpdesk. Information will be available in Dutch and English, with digital support for translating into other languages (both written and spoken).

Finally, we challenge ourselves to communicate in ways that align with children’s experiences and literacy levels—less text-heavy, more visual, and auditory where necessary.

4.6 Professional Use of ICT, Data, and Healthcare Technology

Over time, the IDT department has evolved from a unit providing standard ICT components to a service-oriented department that develops solutions based on the needs and demands of the organization. Key principles include self-service, user-friendly interfaces, device independence, and accessibility from anywhere.

At the same time, these services must meet strict requirements, particularly in the area of information security. A transparent architecture (see 4.3) with clear agreements helps reduce the management burden while preventing uncontrolled growth, budget overruns, and potential risks such as reputational damage. We identify three key areas for professionalization: information security, optimization of the IDT environment, and innovation management.

Ensuring information security means complying with all relevant laws and regulations while maintaining a practical approach for care, research, and support staff. Current processes and responsibilities in this area still lack clarity. Additionally, new technologies like AI introduce security challenges, ranging from automated cyberattacks to risks associated with AI-assisted treatment decisions.

Our IDT environment consists of a network of people who contribute to the effective use of ICT, data, and healthcare technology. However, an unclear distinction between roles at strategic, tactical, and operational levels—ranging from the CMIO, CRIO, and CNIO to local security officers, digital coaches, and data stewards—can hinder smooth workflows.

Effective innovation management requires a clearer structure that allows us to address complex and often unique challenges at the Máxima Center while also efficiently integrating new ideas and technologies into our organization.

Our Ambition

We aim to have a well-structured organization with clear guidelines, ensuring that the use of data and technology aligns optimally with the needs of care, research, and support staff. Both the path to innovation and the support and services from IDT will be transparent to all.

Goals

Information Security

Information security will be managed locally and closely integrated into processes. Compliance assessments and decision-making will primarily rest with process or application owners and local security officers. Employees will have strong awareness and knowledge of information security, enabling them to identify risks, act safely, and actively contribute to the protection of sensitive data.

Optimizing the IDT Environment

We will establish an active network of professionals in care, research, and support roles who enhance the use of ICT, data, and healthcare technology. This network will increase our flexibility by allowing us to respond more quickly to requests and adapt seamlessly to new initiatives. Decentralizing responsibility and ownership will enhance engagement and motivation.

Innovation Management

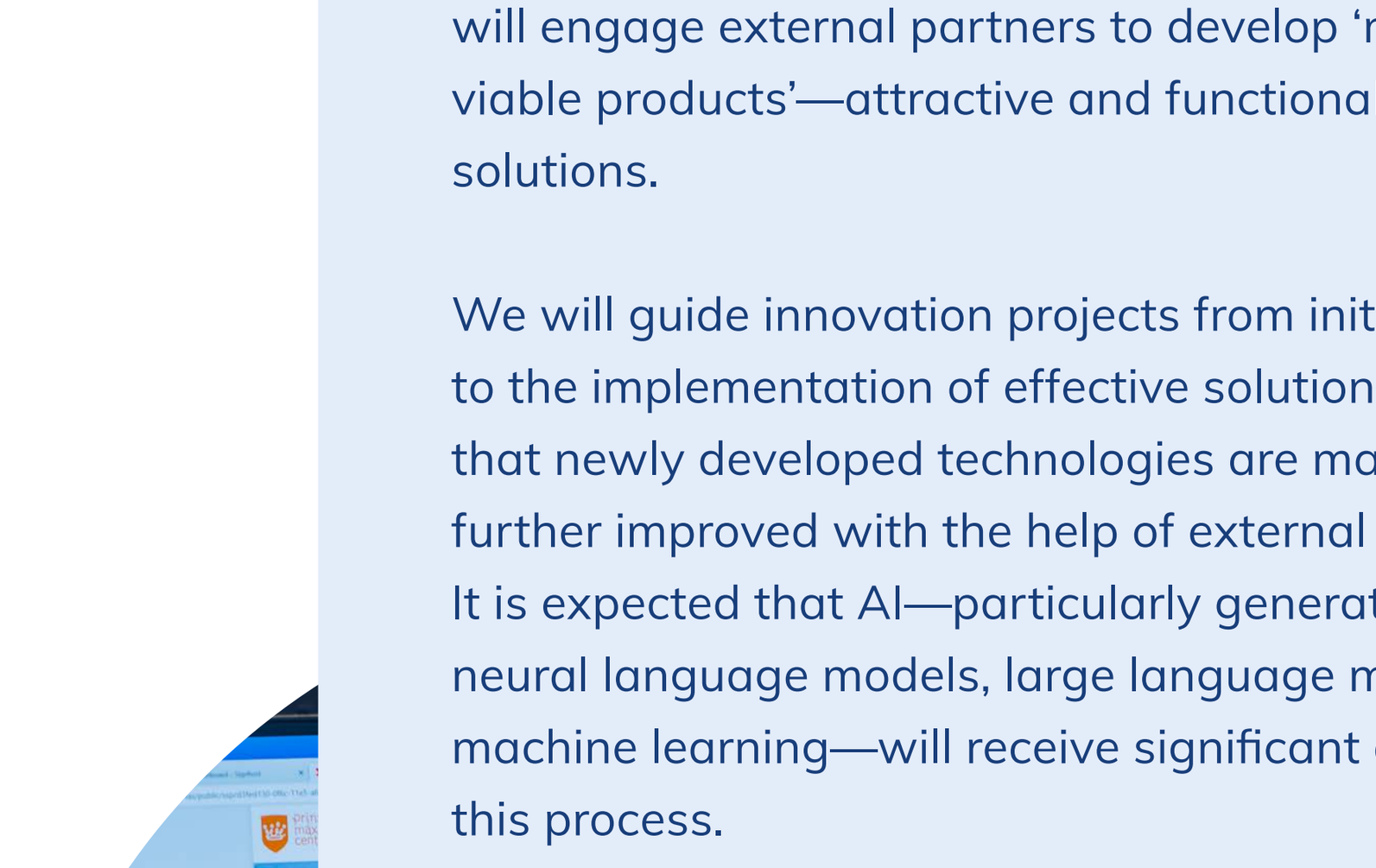
We will implement a clear, integrated process for initiating, developing, implementing, and securing the outcomes of digital and technological innovations. There will also be a structured approach for incorporating and adapting new ideas, technologies, and external developments within the Máxima Center.

How Will We Achieve This?

Information security is a shared responsibility across the entire organization. Local security officers will play a key role, maintaining high visibility within the organization, raising awareness among employees, responding quickly to risks and incidents, and ensuring compliance with policies. Under the direction of the Chief Information Security Officer (CISO), we will provide clear frameworks to support process and application owners in identifying and mitigating security risks effectively.

Optimizing the IDT environment will require clearly defined roles at strategic, tactical, and operational levels, ensuring both horizontal and vertical alignment. Each role will require a fundamental level of knowledge in ICT, data, and healthcare technology, as well as the necessary soft skills to facilitate sustainable change. Only then can we truly say, “We do IDT together.” For innovation management, we will engage external partners to develop ‘minimum viable products’—attractive and functional early-stage solutions.

We will guide innovation projects from initial concepts to the implementation of effective solutions, ensuring that newly developed technologies are managed and further improved with the help of external expertise. It is expected that AI—particularly generative AI, neural language models, large language models, and machine learning—will receive significant attention in this process.



Interview

Patrick Kemmeren, Chief Research Information Officer (CRIO)

Accelerating Knowledge Development in Data-Driven Work

“Within research, some colleagues struggle with standard provisions, particularly regarding good data storage and computing power. The innovative pediatric oncology projects we work on at the Máxima Center generate massive amounts of data. You want to store this data securely and use it for analysis, preferably at the lowest possible cost to free up budget for the real work. Researchers sometimes don’t know where to go with their questions and requests. I also hear complaints about the numerous approvals required before setting up anything new in ICT or data technology. I believe this Digital and Technology Strategy will streamline these processes, allowing our organization to respond more quickly to technological advancements.

At the same time, many people are unfamiliar with the possibilities around storage and computing. Increasingly, cloud solutions are faster and more cost-effective. However, what people are used to doing on local computers often works differently in the cloud. At the Máxima Center, we are experimenting with this transition. I believe we can progress further if we introduce more people in the organization to these possibilities, perhaps through training programs.

‘The Digital and Technology Strategy provides space for new initiatives, enabling us to respond faster to technological advancements.’

The strategy states that the Máxima Center aims to be a data-driven organization. Within research, there is already a group of several dozen people leading the way. I see great opportunities to use this strategy to connect these experienced individuals with those who have less expertise. I suspect many colleagues have latent needs that could be uncovered by engaging them in concrete projects.

In my own research group, we focus on identifying and understanding DNA mutations in various types of pediatric cancer. As a scientist, I eagerly anticipate more modern data storage solutions. We currently manage around 600 terabytes of DNA data, representing nearly a third of Máxima’s total data volume.

We are reaching the limits of what our storage system can handle. But this goes beyond just storage. Data becomes truly valuable when it is actively used and shared. A significant improvement would be the ability to move data more easily—and, where possible, automatically—to the locations where it is needed for computation. And not just within our center, but also in a way that facilitates accessibility for our research partners.

I hope the Digital and Technology Strategy encourages my colleagues in research to think about an infrastructure that benefits us all. Not just by identifying what is lacking—though that is certainly relevant—but also by sharing knowledge about developments in data technology. By connecting the networks and expertise within our organization, we can accelerate knowledge development in this field together.’

5 Preconditions and Follow-up

5.1 The Process of Developing the Digital and Technology Strategy

In April 2024, a working group was assembled to identify the internal and external factors that needed to be incorporated into the Digital and Technology Strategy. This group worked with key figures from across the organization, including the CMIO, CNIO, and CRIO, while aligning with specific digitalization goals outlined in ‘Moving Forward Together,’ Máxima’s multi-year strategy.

The results of this assessment were then discussed in six thematic roundtables, where all relevant stakeholders were invited to contribute. Each roundtable had a designated owner from within the Máxima Center and a moderator from the working group. The goal was to define a vision for 2028 and determine how to achieve it. The outcomes of these discussions formed the foundation of the Digital and Technology Strategy for 2025-2028, as detailed in Chapter 4.

5.2 The Role of IDT in Implementing the Strategy

Before drafting this Digital and Technology Strategy, the IDT management team developed a vision for the department's role within the Máxima Center: **'As IDT, we digitally advance care, research, and staff.'** We believe that our expertise enables us to make a substantial and structural contribution to Máxima's mission. This involves not only supporting research, care, and staff through ICT, data, and healthcare technology but also leveraging digital tools to facilitate the transfer of knowledge and information—both to patients and parents, as well as among professionals.

IDT's Role:

- We are a driver for introducing new technologies and ensuring their optimal and responsible use within the Máxima Center.
- We act as a partner within the organization, bridging the gap between strategy and execution.
- We facilitate the execution of business challenges (programs and projects) and, when needed, take on project leadership (except in cases where we act as the client, which only applies to IDT projects).

Based on these points and Máxima's overall vision, IDT is structured around the following principles:

1. Information provision, ICT, data, and healthcare technology are essential to the Máxima's mission. IDT remains committed to continued investment in all these areas.

2. We strive to make a difference, stimulate knowledge and development, and push boundaries. We want to be a ‘best practice’ in care ICT, both within our organization and beyond (e.g., international partners, shared-care centers, home care, and peer hospitals).

3. As bridge builders, we balance maintenance and innovation. We ensure a strong foundation while maintaining flexibility to accommodate new initiatives. We work closely with colleagues to evaluate and implement technology that advances both care and research.

5.3 IDT Governance at the Máxima Center

The true impact of the Digital and Technology Strategy will be realized only when it is transformed into action. The strategic goals are implemented through programs and projects, with a clear focus on allocating people and resources for maximum impact. This is an ambitious plan, and at this stage, we do not yet know exactly what can be achieved.

A strong governance structure is necessary to determine priorities and make investment decisions. Strategy implementation depends on the availability of staff and budget across IDT, care, research, and staff. Additionally, embedding innovations requires time and expertise from users. This strategy has a direct impact on daily operations.

The IDT Governance Board is responsible for executing the Digital and Technology Strategy. With support from the thematic roundtables, it determines which programs and projects are needed each year to implement the strategy. The IDT Governance Board assigns individuals—both within and outside IDT—to design program proposals. Starting from the 2026 budget, the group will submit annual funding requests in September.

The IDT Governance Board is the guardian of the Digital and Technology Strategy and has the following responsibilities:

- Using the Digital and Technology Strategy to establish guidelines for programs and projects with an IDT component. These guidelines serve as a basis for project prioritization.
- Monitoring the progress of ongoing programs and projects.
- Organizing annual sessions with thematic working groups to update the strategy based on internal and external developments.

To determine priorities and make investment decisions for IDT projects, a clear IDT governance structure is in place. This structure defines responsibility for the Digital and Technology Strategy, using specific criteria to assess project progress and evaluate their contribution to strategic goals. Starting in 2025, the IDT governance model will consist of four governance boards: the overarching IDT Governance Board, which oversees strategic and program-level decisions and three domain-specific governance boards for research, care, and business operations.

These domain-specific groups are essential for evaluating projects within their respective areas and prioritizing them based on the Digital and Technology Strategy. They take input from the overall strategy while also considering ideas and requests from staff members. Additionally, they incorporate external factors such as regulatory changes and new industry developments. They ensure that recommendations and decisions align with daily operations, making space for new innovations and technologies where needed.

It is important to recognize that the Máxima Center is a (research) hospital, where IDT components must be continuously maintained and updated. We must facilitate knowledge exchange and leverage existing expertise while ensuring that innovation does not come at the cost of maintaining and optimizing essential systems. IDT plays a continuous role in supporting operational processes and responding to new legal and regulatory requirements.

In short: The Digital and Technology Strategy provides direction, but we always consider the realities of daily operations.

5.4 Implementing the Strategy: A Dynamic and Cyclical Process

Máxima's Digital and Technology Strategy covers the period from 2025 to 2028. The goals are ambitious and aligned with the multi-year strategy. However, the pace of technological advancements means that today's solutions can become outdated quickly. To remain relevant, this strategy is dynamic and will be updated at least once per year. The IDT Governance Board is responsible for implementing and continuously refining the strategy.

The thematic roundtables established for strategy development will remain active throughout the strategy period, providing ongoing input. Strategic decisions will be integrated into annual plans that translate broad goals into tactical and operational execution. These plans will be supported by well-founded business cases.

We have established an annual cycle, in line with the Máxima's annual planning cycle, in which we periodically update the strategy:

- **Q1:** Evaluation of the previous year's results with the CMIO, CNIO, and CRIO. We assess how far we have progressed in implementing the Digital and Technology Strategy.

- **Q2:** Thematic roundtables provide input on technological advancements. Based on this, the IDT Governance Board with the CMIO, CNIO and CRIO updates the Digital and Technology Strategy.

- **Q3:** The IDT Governance Board advises the Máxima Board on the next year's programming. The advice takes into account developments and needs within care, research and staff and weighs the impact of choices on training (in coordination with the Academy) and, for example, staffing and recruitment (in coordination with HR). The advice leads to a budget request for the new year's Máxima budget. It may also result in applications to the Foundation to support specific projects.

- **Q4:** Budget-approved programs and projects for the upcoming year are launched.

This approach ensures that the Digital and Technology Strategy remains aligned with evolving technological and organizational needs.

Our co-operation with UMC Utrecht

The Máxima Center is an independent research hospital focused on a small and specific patient group. Our scope of specializations and activities is narrower than that of UMC Utrecht and Wilhelmina Children's Hospital (WKZ), with whom we collaborate closely to leverage each other's expertise. In the areas of ICT, data, and healthcare technology, we share many systems with UMC Utrecht or work together on various projects. For example, we have a shared EPR system, and our network infrastructure is integrated between the two organizations.

To achieve our ambitions as Máxima Center, we aim to further strengthen our collaboration with the IT service (dIT) of UMC Utrecht. Currently, UMC Utrecht provides us with ICT services, including HiX, workplace management, and data storage. Our goal is to work more closely on HiX management to maximize the expertise available at UMC Utrecht.

In 2024, the boards of both organizations signed a declaration of intent to collaborate as partners and further invest in digital and technological infrastructure. UMC Utrecht has extensive expertise and capacity available to provide services and drive innovation. At the Máxima Center, the number of ICT experts and available capacity is more limited. Additionally, the scale at which we can implement technological innovations is smaller, which affects the overall impact of our investments. However, our compact and agile structure allows us to implement innovations more easily than in a larger organization, where change processes are more complex due to the need for extensive stakeholder alignment, process integration, and structural adaptations.

Our collaboration seeks to capitalize on the strengths of both organizations. The IDT department at the Máxima Center focuses its resources on the specialized areas where our center excels. Where our strategic partner can deliver higher quality, we procure services from UMC Utrecht's dIT. At the same time, our center serves as a practical testing ground where both organizations can rapidly implement (digital) innovations.

This partnership is formalized through a **governance structure** that ensures its sustainability. To implement our Digital and Technology Strategy, strategic-level discussions take place between our **CxIOs** and those of UMC Utrecht.

6 Conclusion and Next Steps

This document is the result of an intensive process in which many colleagues from the Máxima Center actively participated and contributed. The Digital and Technology Strategy is an achievement we can all be proud of—not only because of its content but also because of the collaborative process that led to its creation. Thanks to broad involvement, we have established a shared vision for our path forward. Let’s maintain this collaboration and continue challenging each other to take new steps.

Now that we have clarified the ‘why’ and ‘what,’ we must focus on the ‘how’—how do we effectively and collectively implement our ambitions in ICT, data, and healthcare technology? What is needed to successfully execute this strategy with all internal and external partners? And how do we continuously balance our ambitions with the available resources and workforce?

This requires ongoing attention, regular evaluations, and continuous prioritization. It is essential to maintain a balance between system maintenance and technological development. We warmly invite everyone at the Máxima Center to contribute ideas and actively participate in this journey.

Now that you have read the Digital and Technology Strategy, you know where we want to go. Do you have a smart idea, a creative solution, or a suggestion? Let us know! Feel free to reach out to Renske, Friederike, or Patrick, or drop by the IDT department. Your input can make a difference!

Colophon

The *Digital and Technology Strategy 2025-2028* was developed under the responsibility of the IDT Governance Board of the Princess Máxima Center. On February 18, 2025, the Board of Directors expressed its support for this strategy as part of *Moving Forward Together*.

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